2. PHILOSOPHY

The philosophy of the Laboratory is characterized by:

- carrying out high quality research;

- balancing a scientist's research and programmatic responsibilities;

- enhancing interactions with the academic community, other NASA centers and federal laboratories, and the international community;

- supporting Project Scientists who represent the scientific interests of the outside community in NASA's mission; and

- reaching out to the general public, thereby nurturing their interests in atmospheric science.

Research Quality

The Laboratory places high importance on measuring and promoting quality in its scientific research. High quality is ensured--to the extent possible--by receipt of funding through peer review processes that support approximately 89% of the work in the Laboratory. The overall quality of the scientific efforts of the Laboratory is evaluated periodically by three standing committees and ad-hoc committees of advisors from the external scientific community, as detailed in Section 9 of this document.

Programmatic and Research Balance

Unlike the situation that is found at most universities, our Laboratory often has relatively large programs, sizable satellite missions, or observational campaigns that require the cooperative and collaborative efforts of many scientists.

A management goal of the Laboratory is to ensure an appropriate balance between the programmatic needs of large projects and the need for scientists to maintain an active individual research agenda. This balance allows members of the Laboratory to continuously improve their scientific credentials.

Interactions With Other Scientific Groups

Interactions with the Academic Community

The Laboratory depends on collaboration and cooperation with university scientists to achieve its goals. Such relationships make optimum use of government facilities and capabilities and those of academic institutions, and assist in the education of new generations of scientists and engineers. Educational programs include summer programs for faculty and students, graduate research fellowships, and postdoctoral associateships. The Laboratory frequently supports workshops on a wide range of scientific topics of interest to the academic community, as shown in Section 12.

NASA and non-NASA scientists work together on NASA missions, experiments, and instrument and system development. Conversely, several Laboratory scientists work on programs residing at universities or other federal agencies.

The facilities, large data sets, and software developed within the Laboratory are routinely made available to the outside community. The list of refereed publications, presented in Section 14, is an indication of the many scientific interactions with the outside community; 67% of the publications involve co-authors from institutions outside the Laboratory.

Prime examples of collaboration between the academic community and the Laboratory include these recently established cooperative agreements with universities:

Earth System Science Interdisciplinary Center (IC), with the University of Maryland, College Park;

Joint Center for Earth System Technology (JCET), with the University of Maryland, Baltimore County;

Joint Center for Geoscience (JCG), with the Massachusetts Institute of Technology;

Joint Center for Observation System Science (JCOSS), with the Scripps Institution of Oceanography, University of California;

Center for Earth-Atmosphere Studies (CEAS), with Colorado State University; and,

Cooperative Center for Atmospheric Science and Technology (CCAST), with the University of Arizona.

These joint centers have been organized to increase scientific interactions between the Earth Sciences Directorate at GSFC and the faculty and students at the participating universities.

University and other outside scientists visit the Laboratory for periods ranging from one day to as long as two years. Some of these appointments are supported by Resident Research Associateships offered by the National Research Council (NRC) of the National Academy of Sciences, and by the Visiting Scientists and Visiting Fellows Programs currently managed by the Universities Space Research Association (USRA). Visiting Scientists are appointed for up to two years and carry out research in pre-established areas; Visiting Fellows are appointed for up to one year and are free to carry out research projects of their own design. A list of NRC Research Associates, USRA Visiting Scientists, Visiting Fellows, and associates of the Joint Institutes during 1997 is provided in Section 10.

Interactions with Other NASA Centers and Federal Laboratories

The Laboratory maintains strong, productive interactions with other NASA centers and federal laboratories.

The ties with the other NASA centers broaden our knowledge base: they allow us to complement each other's strengths-- thus increasing our competitiveness-- while minimizing duplication of effort. They also increase our ability to reach the agency's scientific objectives.

Interactions with other federal laboratories result in activities that are synergistic with those funded by NASA Headquarters. The interactions are particularly strong in the areas of ozone research, radiation, data assimilation studies, water vapor and aerosol measurements, ground truth activities for satellite missions, and operational satellites.

Interactions with Foreign Agencies

The Laboratory has had several ongoing programs in cooperation with non-U.S. space agencies that involve many of the Laboratory scientists.

Major efforts include the Huygens Probe Gas Chromatograph Mass Spectrometer (GCMS), with the European Space Agency; the Total Ozone Mapping Spectrometer (TOMS) Program, with the Japanese National Space Development Agency (NASDA) and the Russian Scientific Research Institute of Electromechanics (NIIEM); and the Neutral Mass Spectrometer (NMS) instrument, with the Japanese Institute of Space and Aeronautical Science (ISAS).

Many research collaborations have been established with international scientists to share NASA data and science activities. A few of the scientists with whom Laboratory members are collaborating include work with:

Professor Liu Gin-Rong, at the National Central University, Taiwan, to establish one of the EOS/Aerosol Robotic Network (AERONET) sites to study aerosol radiative forcing in global climate change.

Professor Lee Lou-Chuang, at the National Cheng-Kung University, Taiwan, to cross-calibrate the Ocean Color Imager (Republic of China Satellite series, ROCSAT-1) with NASA/SeaWiFS (Sea-viewing Wide Field-of-View Sensor), MODIS (Moderate Resolution Imaging Spectroradiometer), and surface measurements.

Professor Fu Qiang, at Dalhousie University, Canada, to analyze Department of Energy/Atmospheric Radiation Measurement (DOE/ARM) measurements of solar/thermal radiation and integration into climate models.

Additional collaborations have been established between the Tropical Rainfall Measuring Mission (TRMM) office and Dr. Riko Oki, Remote Sensing Technology Center, Tokyo; and Dr. Nobuhiro Takahashi, Communications Research Laboratory (CRL), Japan

In addition, scientists in the Laboratory have collaborated with international agencies and universities, in Australia, Brazil, France, Germany, India, Indonesia, Israel, Japan, Korea, Marshall Islands, Mexico, People's Republic of China, Peru, South Africa, Thailand, and the U.K.

Support for Project Scientists

Space flight missions at NASA require interactions between two upper-level managers, the project scientist and the project manager, who are the principal leaders of the project.

The project scientist must provide continuous scientific guidance to the project manager while simultaneously leading a science team and acting as the interface between the project and the scientific community at large. In addition, taking on the responsibilities of a project scientist provides a unique opportunity for Laboratory staff to obtain significant scientific management experience. Typically the Laboratory invites candidates from the senior ranks to fill these roles.

Project and deputy project scientists for current missions are listed in Table 1.

Table I: Laboratory for Atmospheres Project and Deputy Project Scientists

Project Scientists	
Name	**Project**
Robert Adler	AGS
Robert Adler	Zephyr
Pawan K. Bhartia	EOS CHEM
Pawan K. Bhartia	TOMS
Dennis Chesters	GOES
Yoram Kaufman	EOS AM
Christian Kummerow	TRMM
Mark R. Schoeberl	UARS
Joel Susskind	POES
Warren J. Wiscombe	GSFC/DAAC
Deputy Project Scientists	
Name	**Project**
Anne R. Douglass	UARS
Ernest Hilsenrath	EOS CHEM
Charles H. Jackman	UARS

EOS Validation Scientist	
Name	**Project**
David O'C. Starr	EOS

Aircraft Campaign Co-Project/ Mission Scientists	
Name	**Project**
Yoram Kaufman	TARFOX
Randy Kawa	AEAP
Paul A. Newman	POLARIS
Mark R. Schoeberl	TOTE/VOTE
David O'C. Starr	SUCCESS
Anne Thompson	SONEX
Si-Chee Tsay	TARFOX

Outreach and Education

Members of the Laboratory interact with the general public to support a wide range of interests in the atmospheric sciences.

Among other activities, the Laboratory raises the public's awareness of atmospheric science through public lectures and demonstrations, making available to wide audiences scientific data of general interest, teaching, and mentoring students and teachers.

Some details of the Laboratory's outreach activities during 1997 are found in Section 7.

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Send e-mail to the maintainer of this page.
The responsible NASA official is Bob Theis.